



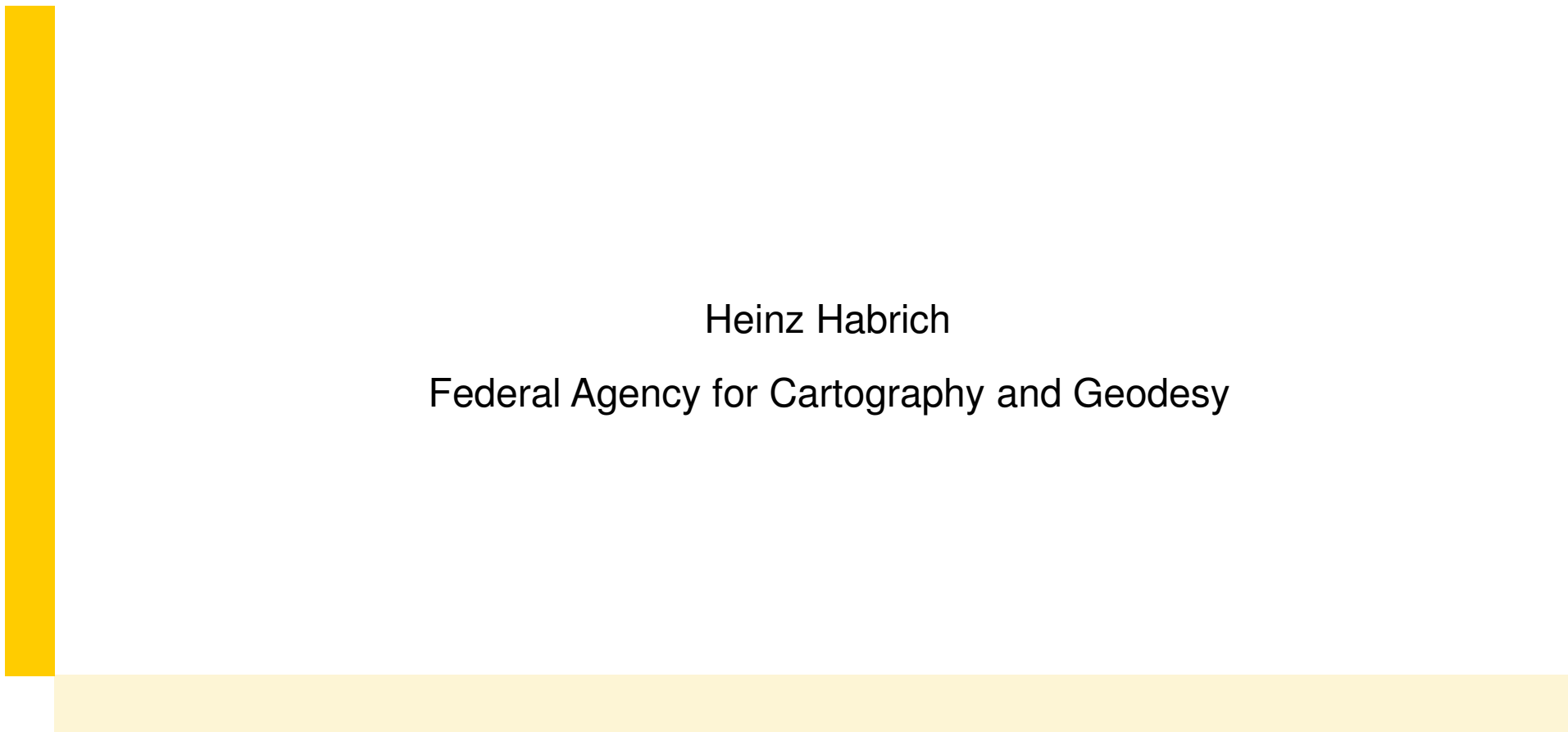
Federal Agency for  
Cartography and Geodesy



# EPN Analysis Coordinator Report

Heinz Habrich

Federal Agency for Cartography and Geodesy





- New Local Analysis Centre
- Updated Guidelines for EPN Analysis Centres
- Redesigned Website at BKG GNSS Data Center
- NEQ-SINEX in EPN Analysis
- Contribution of Analysis Coordinator to EPN Reprocessing
- EPN LAC Workshop 2010



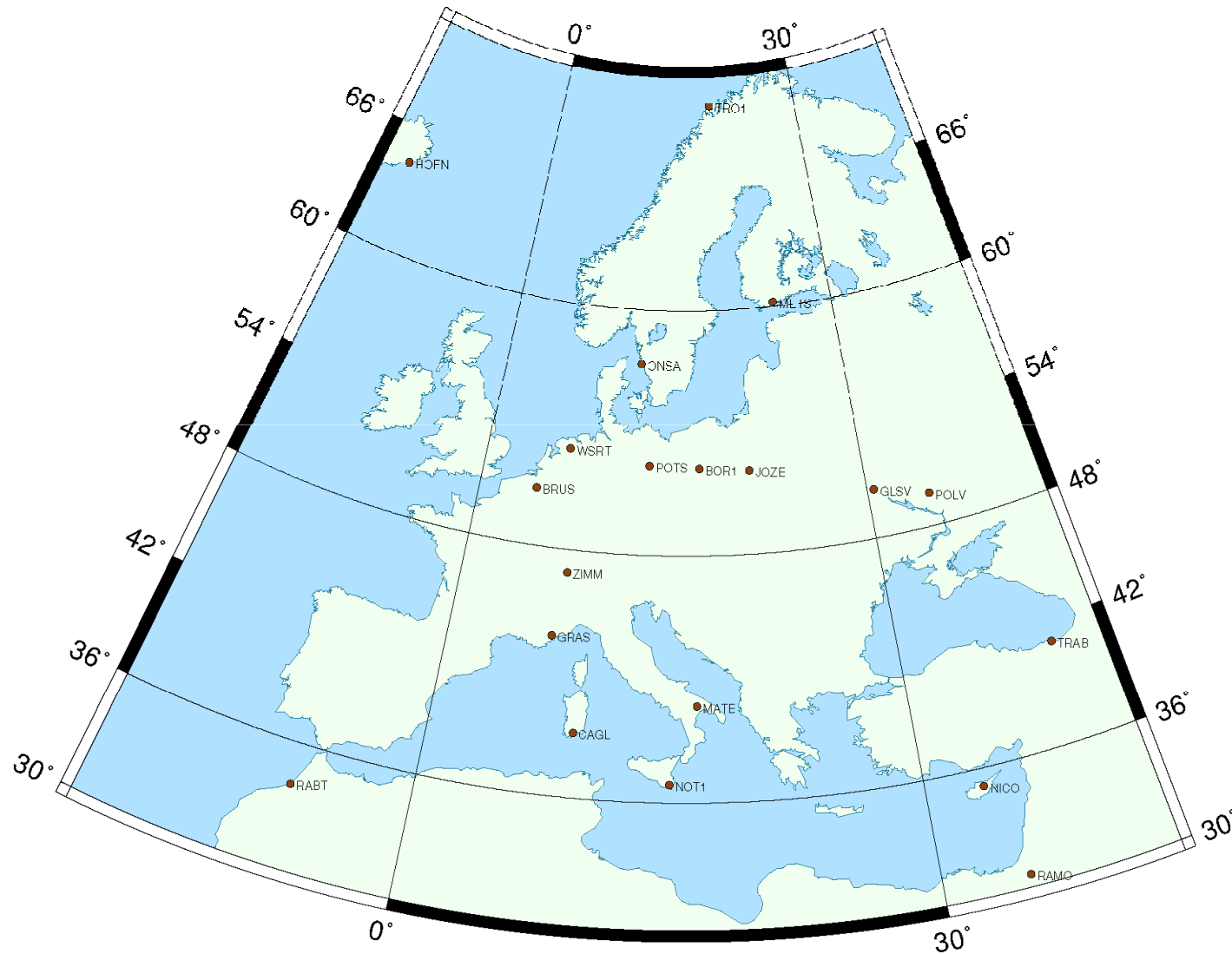
## WUT and MUT LAC Changes - Background -

- Responsibility for Warsaw University of Technology (WUT) LAC changed
  - from Mariusz Figurski, now at Military University of Technology, Warsaw (MUT),
  - to Tomasz Liwosz (WUT)since week 1560 (December 2009) coupled with technical changes
- Request from MUT to continue EPN activity as new LAC
- Separate MUT sub-network accepted by TWG-Chair and EPN AC responding to specific redundancy needs
- Criterion: increase of redundancy from 3 to 4 LACs for all sites



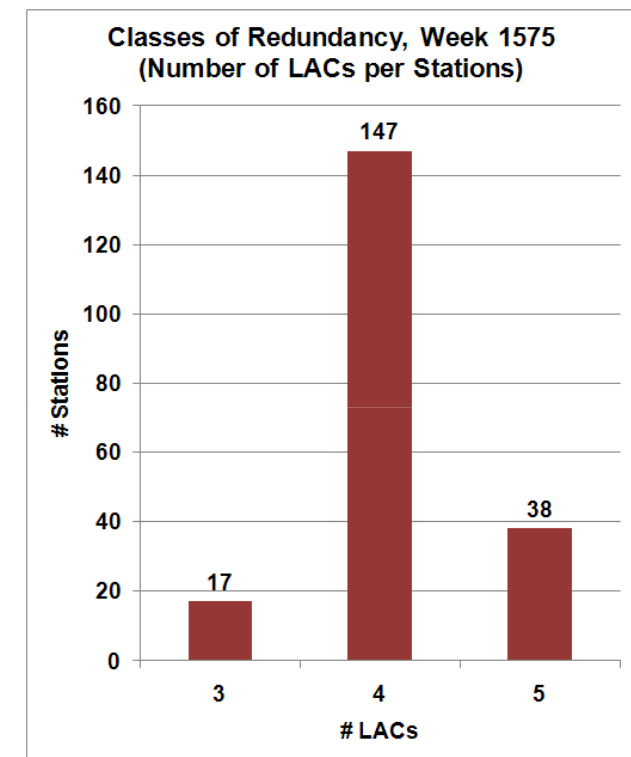
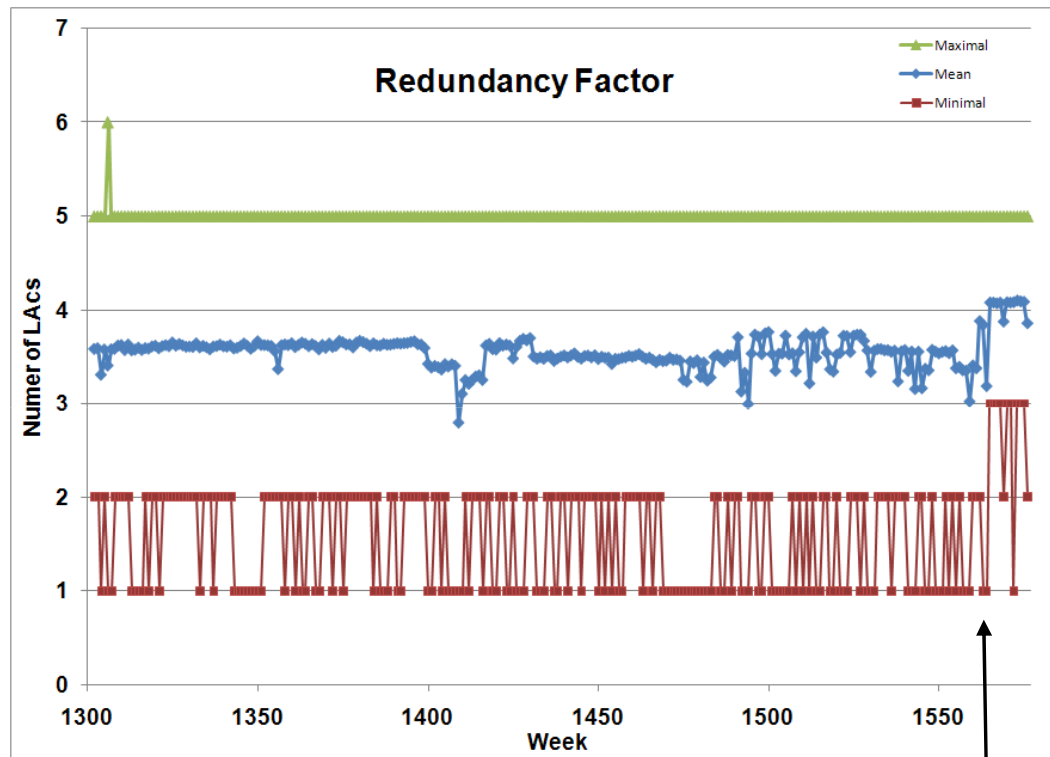


# 20 MUT Reference Stations





# Redundancy





## Guidelines for EPN Analysis Centres

*Prepared by the EPN Coordination Group and the EPN Central Bureau*

### Changes

12-02-2010

- Complete revision of the guidelines (all sections)
- Moving separate EPN Processing Option Table as addendum into the guidelines

1. EPN Analysis Components
  2. Becoming a Local Analysis Centre
  3. Processing Instructions
  4. Submission Guidelines
  5. LAC Performance Control
- Addendum: Processing Options





# Guidelines for EPN Analysis Centres - Analysis Components -

LAC Solutions		Coordinate Combination	
Final Weekly Coordinate Solution	mandatory	Final Weekly Coordinate Solution	
Final Daily Coordinate Solution	recommended	Final Daily Coordinate Solution	
Rapid Daily Coordinate Solution	recommended	Rapid Daily Coordinate Solution	
Hourly Coordinate Solution	optional	Hourly Coordinate Solution	
Final Daily Tropospheric Zenith Path Delays	mandatory	<b>Troposphere Combination</b>	
		<b>Accumulated Coordinate Solution</b>	
		<b>EPN Projects</b>	Re-Processing, Real-Time Analysis, GGOS





# Processing Instructions

## - Mandatory SINEX Data Blocks -



+SOLUTION/STATISTICS

+SOLUTION/EPOCHS

+SOLUTION/APRIORI

+SOLUTION/ESTIMATE

+SOLUTION/MATRIX\_ESTIMATE L COVA and

+SOLUTION/MATRIX\_APRIORI L COVA

or

+SOLUTION/NORMAL\_EQUATION\_VECTOR and

+SOLUTION/NORMAL\_EQUATION\_MATRIX L



### Mandatory

1. Number of observation
2. Number of unknowns
3. Weighted square sum of  $o - c$

“COV-SINEX” and “NEQ-SINEX” accepted





# New Website at BKG GNSS Data Center - EPN Analysis Product Holding -

- HTML now based on “Zend Framework”
  - extending art & spirit of PHP
  - tested codebase
  - modern web 2.0 applications



<http://igs.bkg.bund.de>



# New Website at BKG GNSS Data Center - Project Filter and File Download -

**GDC**  
GNSS DATA CENTER

User:   
Password:   
login

Home About Us GNSS/Files NTRIP Links Project Filter: EUREF

### Content of your cart

filename	size	remove item
eur15811r.snz.Z	1.85 MB	
eur1581mr.crd.Z	13.52 kB	
eur15810r.snz.Z	1.70 MB	
eur15811r.sum.Z	4.19 kB	
eur15814r.crd.Z	13.52 kB	

**Info**  
In here you see the data, which you added to your cart. You can remove a single item, remove all items from the cart or download all data to your computer.

<impressum> <sitemap> <contact>



# New Website at BKG GNSS Data Center - EPN Re-Processing Results -

The screenshot displays the BKG GNSS Data Center website. At the top, the logo "GDC GNSS DATA CENTER" is visible on the left, and a navigation bar contains links for "Home", "About Us", "GNSS/Files", "NTRIP", and "Links". On the right, it shows the user is "logged in as epnr1" with a "logout" button. Below the navigation bar, the breadcrumb path "GNSS/Files > Data Archive > File Browser" is shown. The main content area features a file browser interface with a tree view on the left showing a folder "products" containing a sub-folder "1356". A list of files follows, including various ".snx.Z" and ".sum.Z" files for stations like be013560, be013561, be013562, be013563, be013564, be013565, be013566, eu013560, eu013561, eu013562, eu013563, eu013564, eu013565, and eu013566. The file "be013560.snx.Z" is currently selected. On the right side of the file browser, an "Info" box provides instructions: "Click on the folder at the left hand side and select the file you are interested in. A window will open, which shows detailed information about the file. Then you have the possibility to download the file directly, add it to your cart, look into the file or show the station details to the station, if the selected file is a rinex file." At the bottom of the page, there are links for "<impressum>", "<sitemap>", and "<contact>".



# Re-Construction of Normal Equations - NKG 1560 -

Type of SINEX	Re-Construction Original NEQ	A-Posteriori RMS of Unit Weight	Variance Factor
COVA	NO	0.00100 m set to default ( $v'Pv < 0$ reported)	1.00 set to default
COVA	YES	0.00133 m	1.28
NEQ	NO	0.03647 m	1329.89
		0.00100 m after re-scaling	1.00 after re-scaling
NEQ	YES	0.00133 m	1.28



# Re-Construction of Normal Equations - BKG 1564 -

Type of SINEX	Re-Construction Original NEQ	A-Posteriori RMS of Unit Weight	Variance Factor
COVA	NO	0.03101 m	961.35
		0.00100 m after re-scaling	1.00 after re-scaling
COVA	YES	0.00122 m	1.49
NEQ	NO	0.04075 m	1660.26
		0.00100 m after re-scaling	1.00 after re-scaling
NEQ	YES	0.00122 m	1.49



## Re-Construction of Normal Equations - Status in Summary -

- NEQ-SINEX applied for submission of weekly sub-network solutions of the LACs since March 2010, COV-SINEX continued for EPN combined solution
- 12 LACs submit solutions in NEQ-SINEX
- 4 LACs submit solutions in COV-SINEX (3 explained why to continue with COV)
- More information about re-construction of NEQ in SINEX 2.02 (December 01, 2006) text document





## Contribution of Analysis Coordinator to EPN Reprocessing



- Tasks of the AC
  - Combination of daily and weekly re-processed LAC solutions
  - generation of weekly combination to be discussed (7 days → 1 week by LACs or AC)
- @ BKG Data Center
  - EPN Re-Processing project established
- Trial combination of available weekly submissions for 2006
  - completed
- Trial combination of available daily submissions for 2006
  - completed
- Presentation of Christof Völksen, Chair Re-Processing WG







## ■ First Day

- Reports from the EPN Coordination Group
- Local Analysis Centres reports
- New Analysis Products (near real-time products etc)
- Site, receiver, antenna and other issues

## ■ Second Day – Reprocessing Session

- Reports from pilot reprocessing (year 2006)
- Reprocessing strategies: Test, Results, Problems
- Combination of the Repro-Products and alignment to the Reference frame
- Proposals, plans for future, discussion

[http://www.cgs.wat.edu.pl/LAC\\_workshop/index.html](http://www.cgs.wat.edu.pl/LAC_workshop/index.html)



- Complete analysis solutions (weekly, daily, hourly) for as many EPN stations as possible
- Re-Processing
  - “Do the job”
  - Evaluation of results
- LAC Workshop 2010 in Warsaw
  - Update all aspects relevant for EPN analysis

